

This listing of claims will replace the originally filed claims in the application.

Listing of Claims

Claims 1 – 14 (canceled).

Claim 15 (new): A catalytic composition for the partial oxidation of light hydrocarbon mixtures which comprises:

- i) a perovskite crystallographic structure; and
- ii) a nickel metal.

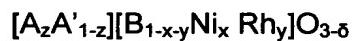
Claim 16 (new): The composition according to Claim 15, wherein said composition further comprises:

- iii) a rhodium metal.

Claim 17 (new): A catalytic composition for the partial oxidation of light hydrocarbon mixtures which comprises:

- i) a perovskite crystallographic structure; and
- ii) a rhodium metal.

Claim 18 (new): The composition according to Claim 15, wherein said perovskite compound further comprises formula (I):



wherein said A and said A' each comprise at least one component selected from the group consisting of the lanthanide family, the actinide family, and group II_a,

wherein said B is at least one component selected from the transition metal groups of columns Ib, IIB, IIIb, IVb, Vb, VIb, VIIb, and VIIIb,

wherein $0 < x \leq 0.7$,

wherein $0 < y \leq 0.5$,

wherein $0 \leq x+y \leq 0.8$,

wherein $0 \leq z \leq 1$, and

wherein said δ is adjusted so as to obtain the electric neutrality of said perovskite compound.

Claim 19 (new): The composition according to Claim 18, wherein said A and said A' each comprise at least one component selected from the group consisting of:

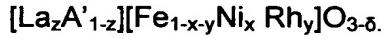
- i) La;
- ii) Ce;
- iii) Ca; and
- iv) Sr.

Claim 20 (new): The composition according to Claim 19, wherein said A is La.

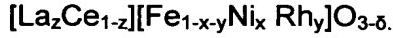
Claim 21 (new): The composition according to Claim 18, wherein said B is at least one component selected from the group consisting of:

- i) Mn;
- ii) Fe;
- iii) Co; and
- iv) Al.

Claim 22 (new): The composition according to Claim 18, wherein said perovskite compound further comprises formula (Ia):



Claim 23 (new): The composition according to Claim 18, wherein said perovskite compound further comprises formula (Ib):



Claim 24 (new): The composition according to Claim 18, wherein $0 < x \leq 0.5$.

Claim 25 (new): The composition according to Claim 18, wherein $0 < y \leq 0.25$.

Claim 26 (new): The composition according to Claim 18, wherein $z < 1$.

Claim 27 (new): The composition according to Claim 22, wherein said formula (Ia) comprises about $\text{La Fe}_{0.7} \text{Ni}_{0.25} \text{Rh}_{0.05} \text{O}_{3-\delta}$.

Claim 28 (new): The composition according to Claim 23, wherein said formula (Ib) comprises about $\text{La}_{0.8} \text{Ce}_{0.2} \text{Fe}_{0.7} \text{Ni}_{0.25} \text{Rh}_{0.05} \text{O}_{3-\delta}$.

Claim 29 (new): The composition according to Claim 28, wherein said formula (Ib) comprises about $\text{La}_{0.8} \text{Ce}_{0.2} \text{Fe}_{0.7} \text{Ni}_{0.3} \text{O}_{3-\delta}$.

Claim 30 (new): The composition according to Claim 15, wherein the operating temperature of the catalyst is in the range of about 500 to about 1300 °C.

Claim 31 (new): The composition according to Claim 30, wherein said temperature is in the range of about 600 to about 1100 °C.

Claim 32 (new): The composition according to Claim 15, wherein the operating pressure of the catalyst is in the range of about 10^5 Pa to about 3×10^6 Pa.

Claim 33 (new): The composition according to Claim 32, wherein said pressure is in the range of about 10^5 Pa to about 10^6 Pa.

Claim 34 (new): The composition according to Claim 15, wherein said partial oxidation process further comprises at least one oxidant gaseous feed selected from the group consisting of:

- i) oxygen;
- ii) oxygen and an inert gas mixture; and
- iii) steam and carbon dioxide.

Claim 35 (new): The composition according to Claim 15, wherein said light hydrocarbon mixture to be partially oxidized further comprises natural gas.

Claim 36 (new): A method for making a catalytic composition for the partial oxidation of light hydrocarbon mixtures which comprises the steps of:

- i) introducing a perovskite crystallographic structure; and
- ii) adding a nickel metal.

Claim 37 (new): The method according to Claim 36, wherein said method further comprises:

- iii) adding a rhodium metal.

Claim 38 (new): A method for making a catalytic composition for the partial oxidation of light hydrocarbon mixtures which comprises the steps of:

- i) introducing a perovskite crystallographic structure; and
- ii) adding a rhodium metal.

Claim 39 (new): The method according to Claim 36, wherein said perovskite compound further comprises formula (I):



wherein said A and said A' each comprise at least one component selected from the group consisting of the lanthanide family, the actinide family, and group II_a,

wherein said B is at least one component selected from the transition metal groups of columns Ib, IIb, IIIb, IVb, Vb, VIb, VIIb, and VIIIb,

wherein $0 < x \leq 0.7$,

wherein $0 < y \leq 0.5$,

wherein $0 \leq x+y \leq 0.8$,

wherein $0 \leq z \leq 1$, and

wherein said δ is adjusted so as to obtain the electric neutrality of said perovskite compound.

Claim 40 (new): The method according to Claim 39, wherein said A and said A' each comprise at least one component selected from the group consisting of:

- i) La;
- ii) Ce;

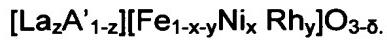
- iii) Ca; and
- iv) Sr.

Claim 41 (new): The method according to Claim 40, wherein said A is La.

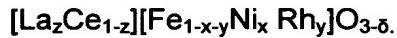
Claim 42 (new): The method according to Claim 39, wherein said B is at least one component selected from the group consisting of:

- i) Mn;
- ii) Fe;
- iii) Co; and
- iv) Al.

Claim 43 (new): The method according to Claim 39, wherein said perovskite compound further comprises formula (Ia):



Claim 44 (new): The method according to Claim 39, wherein said perovskite compound further comprises formula (Ib):



Claim 45 (new): The method according to Claim 39, wherein $0 < x \leq 0.5$.

Claim 46 (new): The method according to Claim 39, wherein $0 < y \leq 0.25$.

Claim 47 (new): The method according to Claim 39, wherein $z < 1$.

Claim 48 (new): The method according to Claim 43, wherein said method comprises about La Fe_{0.7} Ni_{0.25} Rh_{0.05} O_{3-δ}.

Claim 49 (new): The method according to Claim 44, wherein said method comprises about La_{0.8} Ce_{0.2} Fe_{0.7} Ni_{0.25} Rh_{0.05} O_{3-δ}.

Claim 50 (new): The method according to Claim 49, wherein said method comprises about $\text{La}_{0.8} \text{Ce}_{0.2} \text{Fe}_{0.7} \text{Ni}_{0.3} \text{O}_{3-5}$.

Claim 51 (new): The method according to Claim 36, wherein the operating catalyst condition is in the range of about 500 to about 1300°C.

Claim 52 (new): The method according to Claim 51, wherein said catalyst condition is in the range of about 600 to about 1100° C.

Claim 53 (new): The method according to Claim 36, wherein the operating catalyst condition is in the range of about 10^5 Pa to about 3×10^6 Pa.

Claim 54 (new): The method according to Claim 53, wherein said catalyst condition is in the range of about 10^5 Pa to about 10^6 Pa.

Claim 55 (new): The method according to Claim 36, wherein the partial oxidation requires adding an oxidant gaseous feed that comprises at least one component selected from the group consisting of:

- i) oxygen;
- ii) oxygen and an inert gas mixture; and
- iii) steam and carbon dioxide.

Claim 56 (new): The method according to Claim 36, wherein said light hydrocarbon mixture comprises natural gas subjected to at least one process selected from the group consisting of:

- i) partial oxidation;
- ii) reforming (steam or dry);
- iii) selective oxidation;
- iv) hydrogenation reaction; and
- v) dehydrogenated oxidative reaction.